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An Argumentation Analysis of Weblog Conversations

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Abstract[1]

Weblogs are important new components of the Internet. They provide individual users with an easy way to publish online and others to comment on these views. Furthermore, there is a suite of secondary applications that allow weblogs to be linked, searched, and navigated. Although originally intended for individual use, in practice weblogs increasingly appear to facilitate distributed conversations. This could have important implications for the use of this technology as a medium for collaboration. Given the special characteristics of weblogs and their supporting applications, they may be well suited for a range of conversational purposes that require different forms of argumentation. In this paper, we analyze the argumentation potential of weblog technologies, using a diagnostic framework for argumentation technologies. We pay special attention to the conversation structures and dynamics that weblogs naturally afford. Based on this initial analysis, we make a number of recommendations for research on how to apply these technologies in purposeful conversation processes such as for knowledge management.

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1 Introduction

Weblogs, also known as blogs, are frequently updated websites, usually personal, with commentary and links. A blog consists of many short posts, usually time-stamped, and organised in reverse chronological order. Main uses of blogs are as filters on the external world, as personal journals, or as notebooks (Blood, 2002). An important characteristic of blogs is that they have a hyperlinked post structure, making it different from an online diary. These links are made within an individual blog, but, importantly, also between blogs. As a result, blogs are turning into a conversational medium[2].

Blogs and their associated technologies have unique characteristics as a conversational medium, which make their capabilities quite different from other Internet technologies, such as mailing lists or newsgroups. In fact, they are their own genre, situated on an intermediate point between standard Web pages and asynchronous computer-mediated communication along dimensions of frequency of update, symmetry of communicative exchange, and multimodality (Herring et al., 2004). Weblog technologies include such applications as the *weblogs* themselves, *comments* facilities that permit readers to engage in a discussion about particular blog entries, *trackback facilities* to find out about when blog entries have been referred to, and *news aggregators* that collect entries from webloggers and news sources and put them in one place for review[3]. Such aggregators use XML-based markup to present user-tailored views on structured data of their choice, and can be set to only show the posts that changed since the reader last checked[4].

The functionality provided by these technologies has allowed for an interesting set of new conversational practices to emerge. For example, the strongly interlinked personal publishing style of short bits and pieces of information allowed by blogs are very different from the traditional academic publishing styles in which well-thought out, sizeable pieces of content are presented through the official channels (Mortensen and Walker, 2002).

In this paper, we have the following objectives: showing that blogs have a large potential for supporting organizational conversations; demonstrating the complexity of their conversational analysis; and identifying possible research directions. We focus on the key communication characteristic of blogs: it being a medium for distributed, dynamic argumentation in between the private and public sphere. Related types of conversation analysis have been done on other Internet media like newsgroups (Marcoccia, 2004). The focus of our analysis is on the dynamics of the conversation structures generated by the weblogs by performing a socio-technical analysis using the the argumentation model presented in (de Moor

[2] http://radio.weblogs.com/0110772/stories/2002/10/03/personalKnowledgePublishingAndItsUsesInResearch.html [accessed March 3, 2004]
[3] http://radio.weblogs.com/0106698/2003/11/29.html#a200 [accessed March 3, 2004]
[4] http://www.edtechpost.ca/blogtalk_archive/intro_to_RSS2.htm [accessed March 3, 2004]

and Aakhus, 2003). In doing so, we shift the focus from being on the structural elements of individual blogs, i.e. (Herring et al., 2004), to the conversational webs that emerge between multiple blogs over time. We are particularly interested in finding out if and how the argumentation designs naturally afforded by blogs can match the focused argumentation routines required for knowledge management purposes. We then discuss the wider implications of blog conversations and end the paper with conclusions.

2 Weblog Conversations

Weblog conversations, also known as blogosphere stories (Jenkins, 2003), develop around a number of weblogs and other information sources. The analysis by (Jenkins, 2003) describes the typical dynamics of blogosphere stories by distinguishing four types of blog posts found in most such stories: (1) opinion

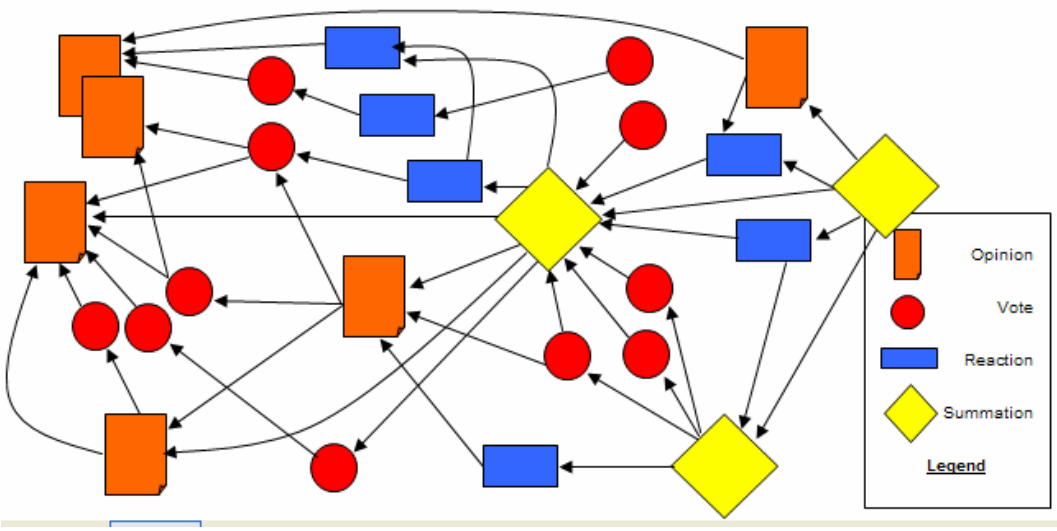

Figure 1 Representation of a Blogosphere Story (Source: (Jenkins, 2003))

posts that define a topic, and usually contain between 3-15 links, one of them being the instigator of the story, (2) vote posts where a blogger (dis)agrees with another post, (3) reaction posts in which a blogger responds to a single post on another site, and (4) summation posts where the blogger summarizes various other blogs. The analysis then continuous by giving a typical story scenario: "Blogosphere stories most often start with an opinion type blog, usually reacting to something in mainstream media. Then, almost within hours several voters point to those original opinions giving either a negative or positive vote. Other opinion writers then add more to the story with reaction posts giving more than just a vote. Reaction posts react to an opinion posts, or to the voters. After some time, a

blogger will summarize what the story is about and draw together some of the opinions, reactions and note the voters. Voters then react to the summary and create another round of voting, reaction and opinion. A story usually ends with an online personality providing a summary of the story, reasonably even-handedly. However, some stories die without a final summation occurring" (Jenkins, 2003).

Fig. 1 represents this typical story scenario. This scenario is an example of unconstrained, natural blogosphere story development. However, conversations can also be seen as a series of interrelated communicative acts aimed at defining and reaching a goal (Dietz, 1994). For *productive* blog conversations, such as required for knowledge management, more carefully tailored socio-technical systems are needed. Such systems cannot be created at once, but should be started small, and grow in socio-technical complexity over time (Röll, 2003; Bausch et al., 2004). For example, (Röll, 2003) proposes to introduce weblogs in the organization by first organizing a pilot project blog, then use the lessons learnt to create multiple project and departmental blogs, and subsequently letting community and personal weblogs emerge.

Most blogs share similar functionalities. However, blogs can be used to support very different types of conversation, depending on the context in which they are used. In an individual blog, for instance, basically anything goes. They are very much bound to the person who owns them. When moving up to the organizational blog, however, the voice of the individual is increasingly lost, and the presentation becomes more organizational and anonymous in voice. Still, it is argued that the true power and uniqueness of blogs is in the individual blogs, where the individual authorial voice is very much present (Winer, 2003). For the purpose of this paper, and since few empirical findings have so far been reported on the use of organizational blogs, we will focus on conversations mediated by individual blogs. However, our claim is that individual blogs can still be used – and in some cases perhaps even better – for organizational purposes such as knowledge management than organizational blogs, provided that their specific characteristics and the natural forms of conversations they permit are taken into account.

Contrary to the analysis shown in Fig.1, we will not address the contents of the conversation. Instead, we focus on examining the distributed nature of the conversation process, one of the key aspects of blog-mediated conversations. Blog-mediated conversations are prime examples of conversations that do not produce traditional monolithic documents, but true dialogic texts, which reflect the involvement of multiple authorial voices (Harrison and Stephen, 1992). New communication technologies transform the way people collaborate. Different forms of computer-mediated communications produce very different types of on-line conversations, or "telelogues'', in which argumentation leads to a wide range of collaboration and coordination patterns (Voiskounsky, 1997) .

In this paper, we do not focus on the subtle differences between the related concepts of conversation, dialogue, and argumentation. A vast literature in

argumentation theory and CSCW exists, for instance, that studies their interrelationships. For the purpose of this paper, we consider a conversation as a - possibly goal-oriented - exchange of ideas, taking place in the form of a dialogue, in which argumentation plays a key role as the interaction process. Argumentation can be understood in two basic ways. There is having-arguments, which is the interactive pursuit of disagreement and controversy, and there is making-arguments, which is the interactive process of forming reasons and drawing conclusions to resolve some matter (O'Keefe, 1977). It is the latter process that we examine here. We are interested in finding out what distributed argumentation means, and how the form it *naturally* takes can be affected by the characteristics of the particular technology mediating the conversation. This, in turn, can lead to more sophisticated insights about in which context a particular argumentation technology can be best applied.

3 An Argumentation Analysis of Weblogs

Weblogs may seem to have deceptively simple functionality, in many ways similar to that of, for instance, mailing lists. A naïve analysis might therefore assume that both types of technologies can be used interchangeably in an organizational context, for instance in supporting knowledge management. However, the conversation patterns that emerge in practice turn out to be very different. In order to successfully use blogs for organizational purposes, finding out about what these natural patterns are, is crucial for matching the right technologies with particular conversation needs.

Crucial in choosing the right technology to serve one's purpose is to analyze the argumentative activity a technology affords as much as its immediate technical feasibility (Aakhus, 2002). To perform a systematic analysis, the framework for socio-technical argumentation analysis (de Moor and Aakhus, 2003) is a useful starting point. It distinguishes between a functionality design, an argumentation design, and argumentation routines. The functionality design consists of all functions that operate on the information objects that the technology can process. The argumentation design comprises the – often subtly – interrelated functionalities, procedures, checks and balances, and connotations that shape the practical range of argumentation behavior. In analogy with biology: the functionality design could be considered as the genotype, the argumentation design as the phenotype of the technology. The argumentation routines, on the other hand, are the customary or expected argumentative practices that define who is allowed to speak, who may listen in, what types of arguments are admissible, how to resolve conflicts, and so on. In fact, they are the communal requirements on the technology. Between argumentation routines and design there usually is a gap. This gap should be minimized.

Jenkins's (2003) summary is a typical example of the unconstrained process in which an distributed conversation emerges out of multiple individual blogs. However, in, for example, a research or business context, a more constrained form of argumentation design may be needed to satisfy the pragmatic argumentation routines required. If the argumentation design would not be taken into account, and the functionality design would be mapped immediately to the required argumentation routines, failure would almost inevitably occur. This because just looking at the technical features would not be too informative of which complex argumentation patterns could naturally emerge in a complex social context of use. Thus, in other words, we are interested in finding out what argumentation designs blogs typically afford to their specific communities of users, so that their potential collaborative applications can be better understood. To illustrate the natural argumentation design that emerges out of collaborating individuals blogging, we explore a small case in which one of the authors was involved. It can be seen as an archetypical case of knowledge creation, which is a major knowledge management activity essential for modern business success (Nonaka and Takeuchi, 1995).

3.1 Case: A Weblog Conversation for Knowledge Creation

The case concerns a small part of an ongoing distributed blog-mediated conversation about the role that blogs play in knowledge work. One week of conversation in November 2003 was examined, ensuing an initial post by one of the authors, in which she raised the problem that writing to a weblog makes visible one's "loose ends", ideas that do not turn into actions, leading to what became known between its participants as the "actionable sense" conversation.

Fully tracing distributed blog discussions is notoriously difficult. As a starting point, we took the final post by the initial author in that one week period[5], in which she links to her own initial post[6], as well as quotes some of those who replied to that initial post. From that final post, we followed in reverse order the explicit links that authors have made to previous posts all the way back to the initial post. We only selected those posts that remained on the initial topic and that quoted part of the posts they linked back to, as we assumed that quoting a post means that it had a major influence on the thought formation of the poster. Many of the posts have generated other links and many comments, but for our purpose of demonstrating the principles behind distributed blog conversations this excerpt should suffice. In our discussion, we come back to the complexities of blog conversation structure.

Fig. 2 summarizes the conversation triggered by the initial post.

[5] http://blog.mathemagenic.com/2003/11/30.html#a855 [accessed March 3, 2004]
[6] http://blog.mathemagenic.com/2003/11/23.html#a849 [accessed March 3, 2004]

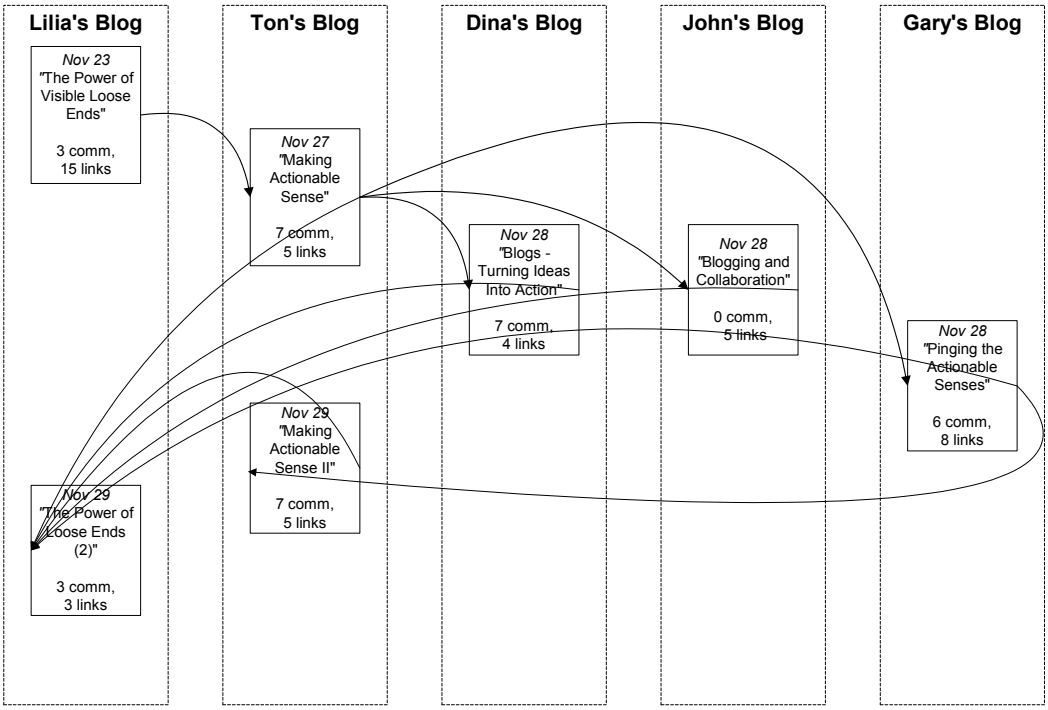

Figure 2 A Representation of a Weblog Conversation

When examining Fig. 2, a number of observations can be made:

- The conversation is distributed among many different blogs.
- The blog owner herself has to actively search for replies in the form of links, through, for instance, trackback-facilities.
- There is quite a time gap between Lilia's original post and the first response by Ton. However, the conversation then intensifies quickly.
- Each post has its own title, suggesting a personal focus of the blog owner.
- Several posts contain many comments and links. The direct responses in this thread, however, concern only a few of those links. This suggests that the posts also play a role in tangential conversations. The form of the conversation is thus much more a web rather than the usual focused discussion tree found in dedicated forums such as mailing lists.
- Lilia's second post summarizes (i.e quotes and interprets) several responses to her original post.

To contrast this new form of distributed conversation mediation with more traditional technology, let us take a look at a conversation of another community,

[tools-yak@collab] PurpleWiki 0.9.1 released, *Chris*, 2004/02/12
- **[tools-yak@collab] Re: PurpleWiki 0.9.1 released**, *Eric*, 2004/02/12
- **[tools-yak@collab] Re: PurpleWiki 0.9.1 released**, *Eugene*, 2004/02/12
- **[tools-yak@collab] Re: PurpleWiki 0.9.1 released**, *Eric*, 2004/02/12
- **[tools-yak@collab] multiple implementations and a public challenge**, *Eugene*, 2004/02/13
- **[tools-yak@collab] Re: PurpleWiki 0.9.1 released**, *Danny*, 2004/02/13
- **[tools-yak@collab] Re: PurpleWiki 0.9.1 released**, *Chris*, 2004/02/13

[tools-yak@collab] Re: PurpleWiki 0.9.1 released, *Danny*, 2004/02/13

Tools-Yak, which is mediated by a mailing list[7]. The community is similar in kind to the blogging community, consisting of people professionally interested in analyzing the role of Internet technologies in building collaboratories.

Figure 3 A Representation of a Mailing List Conversation

Some notable differences can be observed when comparing this conversation with its blog-mediated counterpart:

- The conversation is mediated by a single tool.
- Mails are automatically delivered to all mailing list members.
- The conversation consists of a short, intense exchange of messages.
- The subject header remains mostly the same, suggesting, at least from a retrieval point of view, that the topic of the conversation remains related to that of the original post (as was confirmed by an analysis of the contents of the messages).
- The conversation is threaded as a tree of messages. Messages get either none or very few direct replies.
- No integrating summaries of multiple posts are made. All messages excerpt only the preceding message.

3.2 Applying a Knowledge Management perspective

As we said before, one important use of focused or pragmatic blogging in, for instance a business or research community, could be as an instrument in knowledge management. We now analyze how natural blog conversation characteristics can be useful here, in particular for knowledge creation.

Analyzing weblog conversations, one can easily observe a relatively high (compared to other tools) occurrence of summaries. In our example, in her final post Lilia has summarized some of many links to her initial post, creating her *personal* view of what are the most relevant responses. This summary is linked to her original post and uses a related title, indicating continuation.

The frequency of summaries could be explained by the fact that unlike other tools that support conversations weblogs provide their authors with a personal space next to a community space. As a result at any given time a blogger is involved in two types of conversations: (1) conversations with self and (2) conversations with others (Efimova, 2004).

[7] http://collab.blueoxen.net/forums/tools-yak/2004-02/threads.html#00023 [accessed March 3, 2004]

In the simplest case, a weblog post is fully embedded into "a conversation with self", a personal narrative used to articulate and to organise one's own thinking. A single blogger could have several of such conversations simultaneously, returning to ideas over time. In a weblog this is usually visible as linking to one's earlier posts, use of related titles, or organising ideas using categories or topics. At the same time a weblog post can trigger (or be a response to) a conversation with others, sometimes leading to several independent conversations happen simultaneously.

Compared to a "tree" structure of conversations facilitated by other tools, such as mailing lists, distributed weblog conversations provide an example of "hypertext" conversation: it can follow multiple paths. Adding a new argument, a blogger tries to make it meaningful in both personal and social contexts, by summarizing and connecting earlier arguments.

The social context of weblog conversations requires specific attention. Not being bounded by a single community space, communities of bloggers are in fact "high-density" areas in loosely coupled networks between individual bloggers. The connections between weblogs are enabled by diverse interests of their authors, so, in a sense, each blogger plays a role of a knowledge broker (Lave and Wenger, 1991). As a result each weblog serves as a link that ties different communities and enables development of cross-disciplinary connections (Aimeur et al., 2003).

Our analysis suggests that weblog conversations enable the interplay between articulating ideas in a personal space and social cross-fertilisation, in a form of *perspective making* and *perspective taking* (Boland Jr. and Tenkasi, 1995), thus creating potential for developing innovative ideas (Bonifacio and Molani, 2003). Surveys of factors and conditions enabling knowledge creation, e.g. (Stenmark, 2003), indicate that this is valuable research direction.

4 Discussion

We have shown some properties of blog-mediated conversations for knowledge creation, and illustrated its special characteristics by contrasting it with a conversation pattern typical for mailing lists. In this section, we further analyse some of the complexities, lessons learnt, and possibilities for future research.

The current analysis of the structure of distributed collaborative blog conversations is still very tentative and needs to be extended considerably. Many conversation complexities have not yet been addressed. Some, but surely not all of these complexities we want to hint at here. First, there is the notorious fragmentation of these conversations, which make it very hard to reconstruct them, not only for researchers, but also for the bloggers themselves, as the following quote aptly illustrates:

> "One of my constant frustrations is not being able to keep track of a conversation when it's spread across weblogs and comments on weblogs. There's an interesting comparison with the traditional published literature where citations allow the reader to follow a thread across many journals. The lack of formal writing structures in weblogs often means that citations are not present and the narrative is broken.[8]"

A quick response time is one of the main attributes of successful dialogues (Voiskounsky, 1997). One effect of this fragmentation may be that the conversation slows down. Mailing lists being a 'push' technology may have lower response times than blogs, where finding out how the conversation flows is more cumbersome. This lack in (initial) response time was also demonstrated by the two examples. However, once zoomed in on a particular discussion, bloggers can respond very rapidly as well. As we have seen, the total number of responses can be much higher than in mailing lists. Note that initial empirical findings show that the average number of links to a blog post is lower than often expected (Herring et al., 2004). One explanation could be that the sample analyzed in that study contained many individual journal type blogs. In knowledge creation settings, the blogs serve a very different – collaborative – purpose, in which the number of links is much higher, as exemplified by our typical case.

Contributing to the fragmentation of blog conversations may be the multi-modal character of blog conversations. Comments on posts are often partially posted in the comments field of a particular entry, but also in the blogs of the repliers. Also, although the blog conversation may be the most visible part of the conversation, many other channels are often used, such as e-mail and Internet chat tools like ICQ and Internet phone tools like Skype[9].

Another cause of fragmentation is the complexity of link semantics. Links between posts are of many different kinds. In our analysis, we only considered those posts that directly quote one or more previous posts that are on topic. However, links without quoting can also be made to reinforce an argument or to give credit. Gary, for instance, quotes Ton's post, but says that he was made aware of it by John's post, without quoting John. Furthermore, there is a complex transitivity of links. John, whom Gary links to, himself was made aware of Ton's post by Dina. Gary, however, is in turn quoted by Ton in his second post. This transitivity has many interesting properties, as it could be used to assess the distance between participants, the roles they play, and what kind of cycles occur in conversations, which could be seen as useful feedback loops.

A third complexity has to do with the pragmatics of collaborative conversations. Even in our simple case, we already had significant problems determining which posts to include in our analysis, and which to leave out. One criterion was whether they are on topic. For example, Martin (not represented in

[8] Davies in http://radiocomments.userland.com/comments?u=109961&p=1110, March 6, 2004
[9] http://www.skype.com/

Fig. 2), was the first to post a reply to Lilia's initial post in his blog. He was particularly interested in the aspect of taking enough time to process one's raw ideas. However, the main conversation stayed on the topic of how to make actionable sense, i.e. how to select the best ideas generated on the blogs and doing something with them. It is this topic that has been represented in Fig.2. In hindsight it is relatively easy to identify a topic and thread. How to do this in the heat of the blogging moment, though, is still unclear.

These are just some of the many analytical problems confronting bloggers and their observers alike. In the remainder of the discussion, we would like to identify some possible streams of research that might help bringing more light in the conceptual darkness.

The complexity of blog conversation structure is a daunting problem. Blog conversation representation and analysis would therefore be an interesting domain for the newly emerging science of networks. This branch of applied mathematics uses graph theories to derive properties and solutions for very complex real world problems (Barabasi, 2003). Another promising modelling approach uses the human capability for the rapid interpretation of complex graphical structures to produce illuminating visualizations of conversation structures (Erickson et al., 2002; Brandes and Corman, 2002).

Such analytical approaches are necessary, but not sufficient to improve the use of blogs for purposes such as knowledge management. At least two more material elements are needed: (1) ways to represent the semantics and pragmatics of the blogosphere, so that representation and visualizations can be better focused, and (2) methods for gradually developing the required complex socio-technical systems around blogs, such as virtual communities.

Starting point for structuring the semantics and pragmatics of blog conversations could be provided by the Issue-Based Information Systems (IBIS) paradigm, in which issues, positions, arguments, and their interrelationships are key (Kunz and Rittel, 1970). Such argumentation structures can be used to generate issue networks, to which the many disjunct elements of distributed conversations can be mapped, and so see better conceptual connections and opportunities for improvement. For instance, an issue network can be developed around certain core knowledge topics for an organization. Over time, blog conversations can be hooked into such knowledge maps, when they introduce new issues, help the company to formulate positions, or provide arguments pro and contra these positions. In the traditional issue-based information systems literature, issue networks refer to the issues, their interdependencies, and associated positions and argumentation (Conklin and Begeman, 1989; Conklin et al., 2003), Marres and Rogers, however, extend this definition by introducing an organizational dimension: they define an issue network as a Web of [possibly opposing] organisations that a) discuss a common issue, b) acknowledge one another, and c) interconnect by multiple routes (Marres and Rogers, 2000). The

first definition stresses the semantic dependencies between issues, the second the way issues can be used as focal points for organizational network building. Our definition is an amalgam of these two: an issue network is a set of semantically interrelated issues with associated virtual communities. Superimposing such issue network structures on blog conversations could help to focus both what the conversations are (or should be) about and which (sub)communities are needed to realize certain conversation goals. Furthermore, the IBIS paradigm not only gives us a way to represent arguments, it also comes with heuristics on how to achieve effective argumentation (Conklin, 2003). Creating or traversing the issue networks using these heuristics, might thus help focus blog conversations, making them more pragmatic. Blog conversations, embedded in conceptual issue networks, might be one way to arrive at a truly Pragmatic Web, in which not only meaning, but also purpose is modelled and put into action by integrating it in systems design (de Moor et al., 2002).

Structuring blog conversations around one particular issue network is one thing, but combining and extending individual lessons learnt into best practices could be the next step. To capture such knowledge, socio-technical design patterns for pragmatic blogging would be very useful. Such patterns define a recurring problem in a specified context, an analysis of that problem, and the (named) outline of a solution. They help facilitate meaningful conversations among developers about the purpose of a system, the desired functionality, and the shape of the instantiation of that functionality (Thomas et al., 2002). One such pattern could for instance say that if a certain issue is addressed by a critical mass of individual blogs of employees of a department, then an entry should automatically be generated in the departmental blog, and notification e-mails sent to the bloggers and the department manager to participate in a summarizing discussion. To arrive at useful patterns, three important questions need to be answered: (1) how to guide pattern authors to help produce clear, understandable and helpful patterns? (2) how to support users to explore a design space using patterns? (3) what is the relation between a pattern and software components? (Thomas et al., 2002). Clearly, socio-technical patterns and their uses are still in their infancy, but could play a much needed guidance role in improving fragmented blog conversations and communities.

5 Conclusions

This paper may have created more questions than it has answered. Its aim was not to come up with a definite solution to the problem of what conversation purposes blogs can best serve. Our objectives were, first, to put blogs on the map as a medium with unique characteristics that may have large implications for organizational conversation modelling; second, to give the reader an idea of how difficult the process of getting to more productive blog conversations is going to

be; and, third, to sketch part of the research horizon on which to look for solutions. A more detailed analysis of specific blog functionalities is required, as we only presented some basic technical features of the blogosphere. Variances in different blog implementations might afford quite different conversational behaviours. Even more important, the conversation moves, contents, structures, and dynamics and how they are enabled by specific blog functionalities need to be examined in much greater detail to arrive at more effective and efficient use of blogs.

LAP research could make important contributions to understanding the complexities of this interesting genre of Internet technologies. The current paper concentrated especially on the broad communicative and action patterns that individual blogs afford. This focus on functionality is a necessary first step, given the interest of the LAP community in using communication modelling in real-world information and communication systems. However, major theoretical LAP work, such as its many approaches of conversation and discourse analysis in an organizational context could be very useful in further explicating subtle possibilities and barriers to using blogs for organizational conversations. Also, additional argumentation analysis in the classical sense, such as provided by rhetorics and legal theory and philosophers like Toulmin needs to be added. De Moor and Aakhus's framework of argumentation analysis of functionalities is a conceptual bridge between functionality and argumentation analysis, but needs further refinement, for example on types of argumentation affordances and constraints. Another as of yet unexplored dimension is that of limitations on discourse rationality, such as power and time constraints. How do they affect the realization of effective organizational communication? In short, LAP communication models, its theories about the organizational context of communication, and its approaches for transforming these abstract concepts into concrete system designs could put LAP right in the middle of endeavours to tame the power of blogs for organizational use.

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